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Front Cover: *Darlingtonia*: crimson fang variant. See article on page 100.

Back Cover: A new species of *Heliamphora*, photographed by Dr. Andreas Wistuba. See article on page 120.

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Contents

Color Patterns in *Darlingtonia*

Barry Meyers-Rice • P.O. Box 72741 • Davis, CA 95617 • USA

Keywords: Observations: California, *Darlingtonia californica*, pigmentation.

I once believed that all *Darlingtonia* plants had the same basic coloration pattern. I held this belief because all the articles I read on the genus rarely treated plant pigmentation in any depth, other than to mention that the plants were brightly colored with red and green. However, when I moved to northern California I was bedazzled by the great diversity of color types I observed in wild *Darlingtonia* populations! These pigmentation variants are not documented in the literature, but they deserve to be noticed.

Before I proceed, some warnings are required.

Darlingtonia, like any plant, can be modified by its environment. This is important to remember, especially since *Darlingtonia* grows in an astonishing diversity of habitats. Some sites may be relatively protected shrubby areas on slow seepages of water oozing down gentle hillsides, other sites may be crumbling cliff-faces that expose the plants to burning sunlight, cold nights, concentrated serpentinic water, and physical abuse from tumbling rocks. How strong are the roles of habitat and genetics in determining the pigmentation patterns in the resident *Darlingtonia* populations? It is difficult to tell, and ultimately, this matter may have to be addressed by reciprocal transplant experiments. (Since wild *Darlingtonia* plants rarely thrive when transplanted, there are significant practical barriers to this kind of study.) Pitcher age is also a factor in pigmentation intensity. Pitchers do not display colors well in the spring—the colors are not fully expressed until late summer. Pitchers that survive into a second year may become uniformly red, regardless of the first season's pigmentation pattern. Furthermore, a brightly colored plant, when grown in shade or in less than optimal conditions, may be transformed into a drab specimen.

All these complicating factors may be why we hear so little about *Darlingtonia* pigmentation variants. Field botanists may be dazed by the panoply of habitat types, pigmentation variants and their intergrades, or may simply be uninterested in such details. On the other hand, many of these pigmentation patterns fade when the plants are grown in cultivation. (Indeed, it is well known among growers of *Sarracenia*—a comparatively forgiving plant—that the deep red colors of some plants may fade if they are even slightly disturbed.) As such, horticulturists have also overlooked these pigmentation variants.

The most notable pigmentation characters are expressed in the forked fang appendages and the inflated bell at the top of each pitcher. I will discuss six pigmentation variants in this paper. These are the six I think are most striking, and the most likely to be genetically fixed.

Green fang. This is the simplest color pattern for *Darlingtonia*. The plant is green overall—both on the inflated pitcher-top bell and the fangs. The sepals are yellow-green and the petals are red. Red pigment is present in small amounts on the pitchers, and especially on the pitcher bases. (The wild-occurring cultivar *Darlingtonia* 'Othello' is anthocyanin-free, but occurs in a pitcher plant bog dominated by the green fang variant. Therefore, it is probably related to this population of plants.) Plants of other pigmentation variants, growing in deep shade, may look like this pigmentation variant but they can usually be identified as light-starved impostors because they are floppy and etiolated.

Red-edge fangs. The green fangs of this plant have some red blush near the area of attachment to the pitcher, but most importantly, there is a red stripe running along each fang, filling in the tissue between the outer fang vein and the outer

fang margin (see Figures 1, 2). The primary veins are often highlighted with red pigment. Other than these details, this plant is much like the green fang variant. I have only found the red-edge fang variant scattered sparsely at sites with large numbers of the blush fangs pigmentation variant (see below). Nonetheless, the two types consistently maintain their pigmentation differences with surprisingly few intergrades.

Blush fangs. This pigmentation variant is perhaps the most common in California. The bell is green, but the fangs are liberally blushed with red pigment (Figure 3). While all the pigmentation variants described in this paper may bear red spots throughout the bell and pitcher tube surfaces, some individuals of this variant outshine all the others in terms of spotty excess!

Crimson fangs. The intensely blood-red fangs of this form make this one of the most beautiful pigmentation variants. The fangs contrast boldly against the generally green bells, which are often veined red on the lower surface (see Front Cover). I have seen this variant at only one site, where it grew with large numbers of the two previous variants.

Crimson pitcher. This lovely plant is intensely red over its entire surface. Only the fenestrations interrupt the intense red pigmentation. Red pigmentation may even be expressed on the sepals, peduncle, and floral bracts. The most boldly colored specimens (see Figure 4) of this and the red keel variant I have observed have been on steep, bare serpentine slopes. It is unclear how much of the pigmentation intensity is due to habitat specifics.

Red keel. Like the previous variant, this variant has zones of solid crimson on its pitcher bells and tubes (Figure 5), but the red on this variant's bell is confined to the front-underside surface. The fangs, meanwhile, are surprisingly subdued in their red pigmentation. This variant often occurs with the previous variant, and plants intermediate between the two are common. While it is not at all clear how to sort them out, the red keel and crimson pitcher plants represent good sample extremes.

While these pigmentation variants are at least worth noting, I do not believe they merit formal designation at any infraspecific rank. This paper is not to be misconstrued as a document establishing any *forma*, *varietas*, or cultivar names!

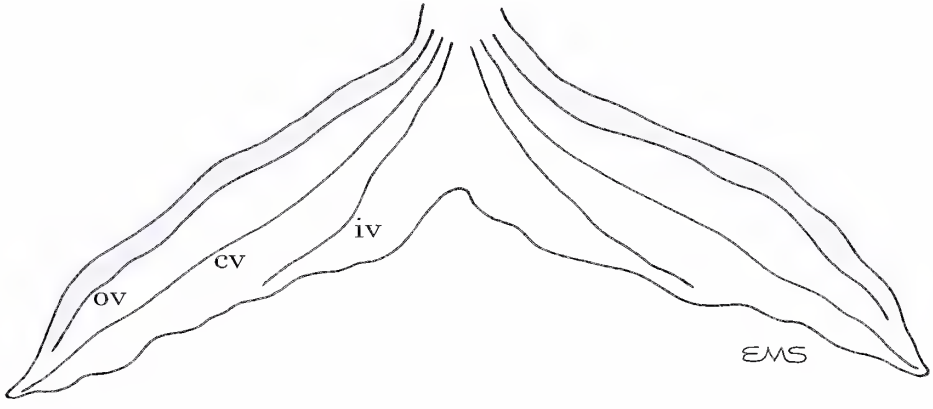

Figure 1: *Darlingtonia* fang profiles. Outer vein (ov), central vein (cv), and inner vein (iv) are labeled for one fang lobe. Shading indicates the distribution of red pigmentation in the red-edge fang variant. Drawn by E.M. Salvia.

Figure 2: *Darlingtonia*: red-edge fang variant. Photograph by E.M. Salvia.

Figure 3: *Darlingtonia*: blush fang variant.

Figure 4: *Darlingtonia*: crimson pitcher variant.

Figure 5: *Darlingtonia*: red keel variant.

Drosera hartmeyerorum spec. nov. (Droseraceae), a New Sundew in sect. *Arachnopus* from Northern Australia

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Keywords: new taxa: *Drosera hartmeyerorum*, Western Australia (Australia).

Abstract: A new species of *Drosera* (sect. *Arachnopus*) from Kununurra, northern Western Australia is described.

Introduction

Australia is the main centre of diversity in the genus *Drosera* (Schlauer, 2000). It is thus not surprising that new species continue to be discovered and described from this continent. In contrast to most recent additions to the genus, the species to be dealt with here does not belong to the species-rich subgenera *Bryastrum* (pygmy sundews), *Ergaleium* (cormous sundews) or *Lamprolepis* (*D. petiolaris*-complex) but to the hitherto monotypic section *Arachnopus* (after exclusion of sect. *Prolifera*, cf. Schlauer, 1996) in subgenus *Drosera*.

Despite its clear relationship to the widespread and variable *D. indica*, the new species can readily be distinguished by erect (not spreading, not incurved-ascending), essentially glabrous (not glandular) scapes and pedicels, and especially by the presence of several (usually 3-10) non-mucilaginous emergences at the adaxial base of each leaf just proximal to the tentacular trapping surface (Figure 1). These emergences carry bright yellow, moriform (i.e. mulberry-shaped) heads that contrast with the usually dark red petiole. Although the various forms of *D. indica* are variable especially with respect to the extension and indumentum of the petiolar region, none of these forms has emergences like this, and in fact no other species of *Drosera* is known so far to possess similar structures. Although they are somewhat similar to the tentacles, their nature or function is not clear. Because they are formed even in juvenile plants, the new species is readily recognizable without microscopic investigation both in the field and in herbarium specimens. Based on observations of plants in cultivation, it is apparent these yellow emergences are not pathogenic in origin.

Description

Drosera hartmeyerorum Schlauer ***spec. nov.***

Caulibus ascendentibus, foliis exstipulatis linearibus acutis petiolis brevibus stylibusque 3, ad basin bipartitis, D. indica affinis sed pedunculis (scapiformibus) erectis, haud patentibus neque incurvatis-ascendentibus, pedunculis pedicellisque glabrescentibus et praecipue emergentiis capitatis moriformibus in regione basali adaxiali foliorum differt.

TYPUS: Ord River region near Kununurra, W.A., Australia, 30. 4. 2001, S. Hartmeyer & I. Hartmeyer s.n. (Herbarium J.Schlauer — HOLO, K - ISO).

Roots few, fibrous, slightly thickened in distal part.

Plants ascending, stems usually up to 30 cm tall, erect (in young plants), stipi-

tate glandular, usually deep red. Leaves patent, later reflexed, exstipulate, linear, acute, adaxially circinnate in bud. Petioles short (up to 3 mm long), lamina with tentacles (ca. 1 mm on surface, up to 2 mm long towards the margins, frequently more than 5 mm long at apex) on its adaxial surface, stipitate glandular on abaxial surface, usually (2-) 3-5 (-6) cm long, ca. 1.5 mm wide, ca. 0.5 mm thick, with revolute margins. Stipitate, bright yellow, moriform emergences at basal portion on adaxial leaf surface (usually 0.5—5 mm from the point of attachment to the main axis). The stalks of these emergences are approximately as long as the stalks of the proximal surface tentacles (shorter than the distal or lateral tentacles). The moriform heads are ca. 5 times as large as the glandular heads of the tentacles, and (probably somewhat depending on the growth conditions) usually the size of the mucilaginous droplets secreted by the tentacles.

Inflorescences ca. 15 cm long in flower, up to 30 cm (in examined specimens, possibly even longer in some individuals) in fruit, lateral but erect (not incurved except for youngest portion with buds that forms a narrow hook or spiral at apex) in flower, diverging from the stem in an almost parallel fashion, not forming a discernible angle with and adnate to the stem for more than one internode. Towards fruiting time the peduncles become sprawling (together with the stems). At this stage they become bent in an irregular fashion. Indumentum (glandular stipitate at base) becoming less dense with increasing distance from the stem and scape almost glabrous along the main portion of its length. Flowers in upper portion of inflorescence, inserted 7-15 mm apart on the peduncle, ebracteate, but scales irregularly interspersed on fertile portion of peduncle. Scales acute with ovate base, concave and incurved. Few moriform emergences (but no tentacles) usually present on adaxial surface of scales, abaxial surface glandular puberulent. Lowest scales up to 2 mm long and 1 mm broad, upper ones usually gradually decreasing in size. Pedicels patent (forming an angle of 70-90° with the peduncle), ca. 1 cm long, almost straight

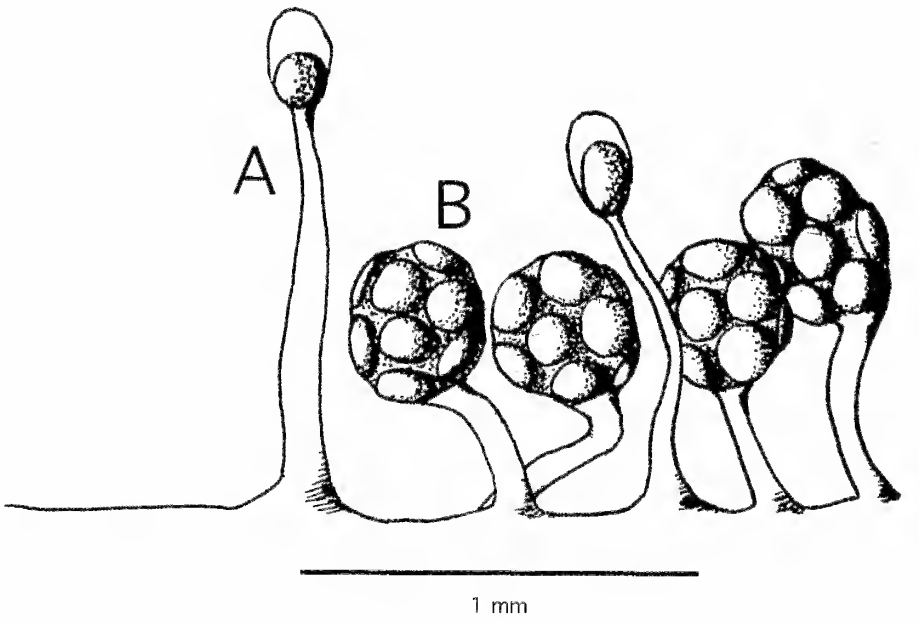

Figure 1: Tentacles (A) and emergences (B) at the leaf base of *D. hartmeyerorum*. Drawing after the type specimen.

in flower, more or less sharply inflexed distally (just below the calyx) in fruit, glandular puberulent only in distal portion (distal 3 mm). Sepals 5, ca. 2.5 mm long, ca. 1 mm wide, essentially free, broadly lanceolate, externally glandular puberulent, margins entire. Petals 5, ca. 5 mm long, ca. 3 mm wide, obovate-cuneate (sometimes apiculate), free, pink, margin basally entire, apically crenate. Stamens 5, alternating with petals, filaments 1-2 mm long, connectives broad but not conspicuously dilated in apical portions, anthers ca. 0.5 mm long, thecae almost parallel, yellow. Pollen yellow. Ovary with 3 locules, globular, styles 3, basally bipartite, filiform, incurved, ca. 3 mm long, white, apical stigmatic portion minutely papillose, not dilated, acute. Fruit a trivalvate capsule, included in withered remains of petals and sepals, globular, ca. 2.5 mm in diameter. Seeds minute (ca. 0.2 × 0.3 mm), ellipsoid, testa foveolate-reticulate (not papillose), black.

Color illustrations are provided in the accompanying article (Hartmeyer & Hartmeyer, 2001).

Distribution, Habitat, Phenology

D. hartmeyerorum is hitherto only known from the type locality. Similar plants have been depicted in the literature (e.g. by Mann, 1997) but the distinctive yellow emergences at the leaf base are not discernible on this illustration. The species may be more widespread, and an examination of herbarium material previously identified as *D. indica* may reveal a more accurate picture of the actual distribution of *D. hartmeyerorum*. The material investigated thus far (from Africa, Madagascar, India, Sri Lanka, China, Japan, and Australia) by the author did not reveal additional localities.

D. hartmeyerorum grows in wet *Pandanus* savannas in lateritic sands (i.e. an iron-rich, tropical sand substrate) marked by high humidity (but usually not submerged in water) and high temperatures throughout the year. The plants are supposedly annual *in situ* (like *D. indica*) but their ability to survive into a second growth period has not been investigated in the field.

Etymology

The new species is named to honour the efforts of Siegfried and Irmgard Hartmeyer who discovered and documented it on video tape in 1995. They returned to the type locality in 2001 to make further field observations (Hartmeyer & Hartmeyer, 2001).

Acknowledgements

I wish to express my sincere gratitude to S. & I. Hartmeyer, who freely supplied all data and material required for the formal description of *D. hartmeyerorum*. The possibility to study the copious *Drosera* material at the herbaria B, K, L, M, P, and TUB is acknowledged with many thanks to the respective directors and curators.

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Observations on a New *Drosera* Species in the Ord River Region (Australia)

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Keywords: field trip: Western Australia (Australia), *Drosera indica*, *Drosera hartmeyerorum*.

Summary

During a trip we took to the Ord River region in 1995, we discovered a tropical sundew apparently distinct from *Drosera indica*. In April 2001 we returned to the Kimberley Mountains and refound this new *Drosera*. We documented on digital video this amazing new species, which develops tentacles with grotesque yellow "heads" that lack mucilage. An herbarium specimen was sent to Dr. Jan Schlauer, who confirmed the *Drosera* to be a new, distinct species and kindly agreed to provide a description to validly publish a scientific name for the plant.

First Discovery

Back in April 1995, the two of us were walking through a spear-grass meadow in the Ord River area north of Kununurra, filming carnivorous plants for a video (Hartmeyer & Hartmeyer, 1995). On that particular day, one of us (SH) found a single plant of a remarkable sundew, which at first glance looked like a red *Drosera indica*. On closer inspection it differed from *D. indica* by the much more delicate looking trapping leaves which had a conspicuous deep red colour, as well as by the orientation of the inflorescence which arose parallel to the erect stem. Odd, light yellow blotches shined through the plant's herbage. These yellow blobs—apparently on the leaves—seemed to be pollen from the various grasses growing in that habitat. We filmed the amazing plant and showed it on our video with the question to the viewer: "This can probably be a new species. Please give us a feed back if you have ever seen such a *Drosera*."

The first reaction came from Dr. Jan Schlauer (a prominent carnivorous plant expert and coeditor of Carnivorous Plant Newsletter), when we showed parts of our new movie at the 1995 annual meeting of the German carnivorous plant society (GFP) in Merzig. He thought the whole plant looked very interesting and asked us for any living plants, seeds or herbarium specimens. Unfortunately on our first trip we did not find any ripe seeds and it goes without a saying that on our video tours we strictly follow the advice: "Take only pictures, leave only footprints". So all we could show were our video pictures, and those were not sufficient to describe a new species, even one as interesting as this.

We were convinced that what we found in the eastern Kimberleys was something related to, but distinct from *Drosera indica*. We planned another trip to find it. However, due to serious health problems which forced one of us (SH) to retire, travelling was impossible for us for a long time. Six long years passed before we returned to the small Kununurra airport, in April again, glad and excited.

The Rediscovery

The weather was much more humid than in 1995. April in the Kimberley moun-

tains means the end of the wet season. The rains brought a lot of moisture this year, and the humidity was still more than 80%. The weather forecast predicted temperatures of nearly a constant 34-36°C (93-97°F) in Kununurra—even the night time temperatures did not drop below 24°C (75°F)! With such oppressive conditions, we decided to spend our mid-days scouting for interesting sites in the air-conditioned safety of our rented car, to take breaks during the hottest part of the day, and to return to interesting locations in the later afternoon for filming. It is much more difficult to detect *Byblis* and *Drosera* in the afternoon because their flowers close and the plants can hid among the grasses.

We first drove to the meadow several km north of Kununurra where we had found the fascinating red sundew six years ago. But this site was still flooded and not even a *Utricularia* flower was visible. We inspected the surrounding area but without success. A little disappointed, we stopped at another place where in 1995 we had found huge *Drosera ordensis* inhabited by small *Cyrtopeltis* bugs. Again we were disappointed because some kind of cable had been laid along the roadside, and the surface was now covered with a thick layer of laterite and sandstone gravel. All the vegetation was destroyed.

In Germany people say: "All good things are in threes!" So we decided to make a third attempt to find this sundew, and followed our own advice for finding carnivorous plants in the Kimberleys, which we gave in one of our videos (Hartmeyer & Hartmeyer, 1995): "Look for groups of *Pandanus* trees in spear-grass meadows along the road." We travelled until we found a group of four or five of these distinctive trees along the road, and then stopped the car. The grassy meadows start around 3 to 4 m from of the road. After only a few steps into this meadow, we were astounded to find that we were not standing in front of *Drosera burmannii* or *Byblis filifolia*, which would have been typical. No, we almost did not believe our eyes because the first carnivorous plant we found this day was the red species we were seeking! Our first plant, and we had planned to spend the next two weeks looking for it! Despite our excitement and high spirits, we decided to return to our bungalow for a refreshing break. (35°C, i.e. 95°F, can be very hot if there is no shade to retreat to!) After the tropical sun reduced its power a little, we reapplied our sunscreen, added some "Bushman Ultra" insect repellent, and drove back to the site to record the *Drosera* on digital video tape.

It was April 21st, about 4:30 p.m. An additional macro-arm for the camera was fixed on a tripod for some close ups, and the white balance was set. The soil was fine sand, which was eroded from the very old sandstone formations of the Kimberleys known as "Bungle Bungles," and also contained fragments of red laterite. We had to kneel to videotape the plants, and in doing so discovered that the dry-looking soil was actually moist because our pants began wicking water from the ground. Evaporation of this moisture must help produce a cool micro-climate that helps the plants survive in these hot, sunny sites. The gravel deposited by the road-building crew, although just a few meters away, was dry and too hot to stand on barefoot—as you might expect almost no vegetation grew there.

The spear-grass is the dominant vegetation, and grows approximately 2 meters tall. *Pandanus* trees are of course present, as well as several other grasses, some small flowering herbs, numerous flowering *Byblis filifolia* (inhabited by symbiotic *Setocornis* bugs) and a few small *Drosera ordensis* plants.

After a first look on the small LCD screen of the video camera, one of us (SH) realised that the bright yellow blobs visible in the original, 1995 video were present on the leaves of these plants as well. Furthermore, they were clearly not caused by adhering grass pollen. The yellow blobs occurred on nearly on every leaf, approximately 5 mm from the stem. We theorized they could be the eggs of a butterfly? An attempt to remove the "eggs" showed that they were attached to the plants, and actually behaved like parts of the plant. Very strange for a sundew!

Figure 1: The new *Drosera* in the field.

Figure 2: Two views of the yellow stalked structures on the leaves of the new *Drosera*.

As I (SH) studied these plants, I heard Irmgard's voice: "Zwanzig Meter weiter sind noch mehr als hundert Pflanzen." The camera was moved and the nicely pink-flowering and fruiting insect-eaters were inspected more closely. After several minutes of investigation, it was clear that we needed to send herbarium material to Jan Schlauer for more study, because the yellow blobs definitely seemed to be a regular feature of the plants. They appeared on every leaf, and looked like modified tentacles carrying a yellow, non-sticky head instead of a mucilage droplet. At present the function of these strange structures is just speculation. However, no other *Drosera* species produces such yellow structures—certainly *Drosera indica* does not have these features.

At about 6:00 p.m., the temperature display on Siggi's watch indicated 29°C (84°F). As the air cooled, the relative humidity rose, and we could feel it. Fine streaks of mist rose from the soil among the spear-grass plants. We filmed the tropical sunset, but it soon became time to return to "Kona Lakeside" because the biting insects ("mossies") became so numerous that even our "Bushman Ultra" repellent was useless.

That evening, we celebrated the rediscovery of our sundew by viewing the fresh video footage of our "catch of the day," and drinking a very fine bottle of Australian Cabernet Sauvignon.

Back in Germany we quickly met with Jan Schlauer. On the basis of our preserved herbarium material he confirmed our suspicions that the plant was a distinct, new species. He agreed to describe this amazing sundew with a new species name, so we could concentrate on working on our new video. For the botanical description of this plants, see the report in this same issue of Carnivorous Plant Newsletter (i.e. p 104, Schlauer, 2001). Also, do not hesitate to visit us on the internet at: www.hartmeyer.de.

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Looking Back: CPN 25 years ago

John Burnes revealed his trick for improving ventilation and humidity in terraria: "I connected an old aquarium air pump to an air stone with plastic tubing. The air stone was placed in a quart jar of distilled water (about 2/3 full) inside the aquarium. This moving air and bubbling water seems to have helped my plants greatly...."

IMPORTANT REMINDER:

Did you renew your ICPS membership yet? The year your membership will expire is printed on your CPN mailing label. If it is "2001", your membership will expire at the end of this year.

Keywords: cultivar: *Dionaea* 'Jaws', *Sarracenia* 'Golden-Red Jubilee', *Sarracenia* 'Green Rosette', *Sarracenia* 'Harvest of Gold', *Sarracenia* 'Hummer's Hammerhead', *Sarracenia* 'Hummer's Okee Classic', *Sarracenia* 'John's Autumnal Splendor', *Sarracenia* 'Super Green Giant'.

Dionaea 'Jaws'

Received: 20 October 1999

This plant is the result of the breeding program at California State University, Fullerton. On 3 June 1993, I crossed *Dionaea* 'Dentate Traps' (see Carniv. Pl. Newslett. 29, p16), a wild-collected plant with its marginal tentacles mutated into short teeth, with a plant we grow which is noteworthy for its consistently extra large, moderately red-colored traps. This plant was selected from the seedlings. The margins of the trap are dentate like the pollen parent. Like the seed parent, the traps are consistently large, with good coloration. The plant is vigorous and even though the traps do not have normal cilia, they do trap insects. Other siblings are being evaluated.

The cultivar epithet, 'Jaws', is named for the remarkable shark-like aspect of the partially closed traps (Figure 1). The cultivar name was inspired by the movie "Jaws", and refers to the large traps and the form of their marginal spines; I nominated this name in (approximately) 1995, and it was submitted for registration by Barry Meyers-Rice on 20 October 1999. The preferred method of propagating this plant is by vegetative means, in order to maintain the characters of the teeth and traps.

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Sarracenia 'Hummer's Hammerhead'

Received: 1 December 1999

This plant has the parentage *Sarracenia* (*psittacina* × *alabamensis*) × *alabamensis*, and is a very vigorous grower. Its outstanding features are best noted in the late season, autumnal leaves which are unmistakable. (Early season leaves show much less pronounced features.) This plant is particularly notable for the upright, pubescent leaves, which together with the bright coloration of yellow gold and numerous areolae and bright red venation throughout. Most striking is the elongated, flattened, and somewhat downwards pointing hood. The plant is overall quite compact, since the pitchers are usually 10-20 cm (4-8 inches) in length. The flower petals are deep red, and contrast nicely with the bright golden pitcher leaves. In order to maintain these characters, this cultivar should be propagated vegetatively.

I developed this cultivar in May 1992. The name was coined in 1996 by Bill McLaughlin. The cultivar name notes the peculiar shape of the pitcher hood.

—JOHN HUMMER • 1705 N. Quebec Street • Arlington, VA 22207-3017 • USA

Figure 1: *Dionaea* 'Jaws'. Photograph by Leo Song.

Figure 2: *Sarracenia* 'Hummer's Hammerhead'

Figure 3: *Sarracenia* 'John's Autumnal Splendor'

Figure 4: *Sarracenia* 'Hummer's Okee Classic'

Figure 5: *Sarracenia* 'Super Green Giant'

Figure 6: *Sarracenia* 'Golden-Red Jubilee'

Sarracenia 'John's Autumnal Splendor'

Received: 1 December 1999

This plant has the parentage *Sarracenia jonesii* × *alabamensis*. The plant is a fairly robust grower with leaves averaging 25-50 cm (10-20 inches) in length and which are slightly pubescent. The hood is undulate and often pointed at the tip. The leaf coloration varies according to the intensity of sunlight it is grown in. The lower third of the leaf is green with some red venation. The upper two-thirds of the leaf exhibit deep red color throughout, and venation that tends towards golden yellow on and around the hood. This results in a striking effect when seen from a distance. Specimens growing in full sun, and undisturbed for years can become a deep maroon throughout, with only a hint of yellow-gold here and there. Flower petals are a deep maroon color. In order to maintain the complex cultivar characters, this cultivar should be propagated vegetatively.

I developed this cultivar in the 1980s. I coined the name in 1988. The cultivar name notes the beautiful gold and brown colors in the fall leaves.

—JOHN HUMMER • 1705 N. Quebec Street • Arlington, VA 22207-3017 • USA

Sarracenia 'Hummer's Okee Classic'

Received: 7 April 1999

This plant is a cross between a *Sarracenia alabamensis* and a *Sarracenia minor* 'Okee Giant'. The hybrid is a fairly robust grower with pubescent leaves that reach 30 cm (12 inches) or more in height. The hood of the leaf is distinctly convex, and is maroon in color when grown in full sunlight. The leaf tube is a melange of green and gold, with the upper rear third of the pitcher leaf exhibiting numerous areolae. These areolae are distinctly veined with red pigment. The flower petals are showy, with pastels of both red and yellow blended together. In order to maintain the complex cultivar characters, this cultivar should be propagated vegetatively.

I developed this cultivar in 1991 and coined the name on 6 April 1999. The cultivar name refers to the obvious influence of the pollen parent.

—JOHN HUMMER • 1705 N. Quebec Street • Arlington, VA 22207-3017 • USA

Sarracenia 'Super Green Giant'

Received: 18 November 1999

This *Sarracenia* (*psittacina* × *jonesii*) × *rubra* subsp. *gulfensis* is notable because all of its parent plants are anthocyanin-free. The plant is entirely anthocyanin-free, a robust grower, and upright. The hood is convex with a rounded appearance. The pitcher leaves are gently curving, and areolae are present on the rear upper third of the pitcher leaf. Pitcher leaves are 20-30 cm (8-12 inches) or more in height. The flower petals are green. In order to maintain the complex cultivar characters, this cultivar should be propagated vegetatively.

I developed this plant in the 1990s and nominated it on 18 November 1999. The cultivar name refers to the large size and green color of the plant.

—JOHN HUMMER • 1705 N. Quebec Street • Arlington, VA 22207-3017 • USA

Received: 24 December 2000

This plant is a cross between *Sarracenia jonesii* and *Sarracenia alabamensis*. While this is the same parentage as my cultivar *Sarracenia* 'John's Autumnal Splendor', the *Sarracenia jonesii* parent is from a different location, and the two cultivars are different in overall effect.

While always an attractive plant, this plant really shows off in the late summer and autumn—the leaves have heavy, dark venation set against a deeply golden background. The dramatic leaves, glowing in the late afternoon sun of October, give the plant the notice and prestige it deserves! These leaves are erect, 20-35 cm (8-14 inches) in height, and bear almost oversized lids with slightly undulating margins. The flower petals are very dark maroon, as expected for this cross.

In order to maintain these characters, this cultivar should be propagated vegetatively.

I developed this cultivar in May 1997. I coined the name 27 December 2000. The cultivar name notes the nice coloration and pattern of the mature plants, late in the season.

—JOHN HUMMER • 1705 N. Quebec Street • Arlington, VA 22207-3017 • USA

Sarracenia 'Green Rosette'

Received: 24 December 2000

This cultivar name applies to anthocyanin-free clones of *Sarracenia psittacina*. The one shown in the photograph was originally collected from Gulf County, Florida. This specimen is fairly robust and readily produces clonal offsets. It also selfs well and produces many seed which germinate readily after a four week stratification period. As expected for an anthocyanin-free variant of this species, it is entirely green except for the numerous white areolae. The flower petals are a creme-yellow.

In order to maintain the primary cultivar characteristic of being anthocyanin-free, this cultivar should be propagated either vegetatively, or by crossing two anthocyanin-free *Sarracenia psittacina* parents.

I selected this cultivar in May 1988. I coined the name 27 December 2000. The cultivar name refers to the anthocyanin-free form of the plant.

—JOHN HUMMER • 1705 N. Quebec Street • Arlington, VA 22207-3017 • USA

Sarracenia 'Harvest of Gold'

Received: 24 December 2000

This plant is a cross between *Sarracenia alabamensis* and *Sarracenia rubra* subsp. *gulfensis*. The leaves are pubescent, 20-30 cm (8-12 inches) in height, and the leaf hoods are undulate. The cultivar's showiest leaves are produced in the summer to early fall. These show traits of both parents—there is a pronounced darkened gold background color to the pitchers, enhanced by distinct vertical red venation throughout the leaf. These characteristics are much less obvious in the spring or early summer leaves. The flowers have deep maroon petals.

In order to maintain these characters, this cultivar should be propagated vegetatively. This is easy because it is a robust grower and forms clonal offsets readily.

I developed this cultivar in April 1988. I coined the name 11 April 1999. The cultivar name notes the attractive golden and red colors that are expressed most strikingly during the fall.

—JOHN HUMMER • 1705 N. Quebec Street • Arlington, VA 22207-3017 • USA

Figure 7: *Sarracenia* 'Green Rosette'

Figure 8: *Sarracenia* 'Harvest of Gold'

International Carnivorous Plant Society Seed Bank

John Brittnacher, Manager • P.O. Box 72222 • Davis, CA 95617 • USA
john@carnivorousplants.org • http://www.carnivorousplants.org

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D. burmannii
D. capensis—narrow leaf
D. capensis—purple flower, narrow leaf
D. capensis 'Albino'—white flower
D. capensis—red
D. capensis—wide leaf
D. capillaris
D. dielsiana
D. filiformis var. *tracyi*
D. gigantea
D. indica—Taiwan
D. intermedia
D. intermedia—giant, Carolina
D. intermedia—North Carolina
D. intermedia—Rhode Island, USA
D. nidiformis
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D. rotundifolia—Rhode Island, USA
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The money raised by the seed bank is used by the ICPS to pay for seed bank expenses, web site ISP charges, and ICPS educational and conservation programs. Donate seed and get credit for free seed from the seed bank.

Ivan Snyder (bioexp@juno.com) wrote about a recent Florida trip he took with Ed Read, led by Bob McMorris: You have heard this before. I have seen a lot of glorious photos of wild stands of *Sarracenia*. But no photograph, I learned, can transmit the essence of actually being present amongst these wonders of nature. (Even so, after my trip, viewing photographs of natural sites now gives me a new special feeling.) Before our expedition I did not feel so deeply about wild populations of North American pitcher plants, but seeing the wild beauties in situ has opened my eyes. I am not the first to suggest this, so perhaps it is true, but for the most awesome botanical experience of a lifetime you must journey to a pitcher savanna.

Unfortunately, along with the pleasant we also witnessed the opposite. We encountered a number of apparently doomed carnivorous plant sites around Florida giving way to urbanization. There is a bright side for small plants found along the roadsides—butterworts and sundews actually seem to benefit from Man's activities. Mowing clears larger vegetation and opens up habitat for these plants.

Man has wisely seen fit to set aside places such as Apalachicola National Forest for future generations to enjoy. A definite sign of our own maturation. *Sarracenia* are faring well in the Apalachicola where the savanna habitat is protected and managed. These treasure troves of nature are surely among the most grand. I salute and humbly thank all those working to preserve the beauty of our world.

(*Ivan mentioned he had some other photographs of habitat destruction without the grim, gallows humor of the one below, but decided they may be too graphic for sensitive CPN readers—BMR.*)

Figure 1: A wetland dryad (Ed Read) protecting *Sarracenia* from a bulldozer.

Stefan Wendland (pharmdj@mindspring.com, 7985 SW 187th Ave., Dunnellon, FL 34432, USA) sent in a note entitled, "Free Water?": As every member of the ICPS knows, having a mineral free source of water is vital for the health of a carnivorous plant. Many growers use reverse osmosis systems or other expensive means to obtain good water. I would like to share with you my experience in getting "free" pure water.

When I joined the ICPS in March of 1998 I had only a few *Nepenthes* species to care for in addition to my outdoor collection of *Dionaea* and *Sarracenia*. During the summer months in my home in New Jersey I collected water from the dehumidifier in my basement and stored the extra water for winter in plastic garbage cans. My plants did very well—for example my *N. ventricosa* bloomed. Since my move to Florida, I have been using the water from the water outlet of my air conditioner. This is essentially water produced the same way it was before, with the only difference being that it is now being produced by the dehumidifier component of the air conditioner instead of a stand-alone unit. My plants are still doing well and I recommend either method.

Clyde Bramblett (18950 SW 136th Street, Miami FL 33196, USA) wrote about the annual ramble (show) at Fairchild Tropical Garden: We have been putting on a display of carnivorous plants in this show in the name of the ICPS since 1984. We haven't missed a year—even when we had hurricane Andrew in 1992. Last year we had over 10,000 people visit our tent. As usual it was very well received. It is always amazing how many people have never heard of a carnivorous plant. The Ramble will be held on November 11 & 12 this year and we are gearing up to do it again.

By the way, I had a *Nepenthes khasiana* produce upper pitchers this year. I never had one produce upper traps before. This was a female plant, and it had five or six flowering stalks at once. My male plant had 14 bloom stalks at once. Before hurricane Andrew, this plant had vines up to 30 feet (10 meters) long.

Figure 2: At the Ramble—left to right, Bob McMorris, Bruce Bednar, Creig Johnston, Manny Herrera, and Michael Hunt. Not shown: Cliff Dodd (seeking palms) and Clyde Bramblett (behind the camera).

Heliamphora folliculata, a New Species of *Heliamphora* (Sarraceniaceae) From the 'Los Testigos' Table Mountains in the South of Venezuela

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Keywords: new taxa: *Heliamphora folliculata*, Venezuela.

Received: 14 April 2001

Introduction

In January 2001 we had the great opportunity to study the flora of some of the least explored of all table mountains of southern Venezuela. Some of the expedition's destinations were the four table mountains in the Aparaman-group ('Los Testigos'), consisting of Aparaman Tepui, Murosipan Tepui, Tereke-Yuren Tepui and Kamarkaiwaran Tepui (Steyermark, 1986; George, 1988). The Aparaman-group is located in the northern part of the Guayana Shield, northwest of Ptari Tepui and east of Auyan Tepui. The altitude of these tepuis lies between 2100 meters (Tereke-Yuren) and 2700 meters (Kamarkaiwaran).

On all tepuis of the Aparaman-group we found a very interesting, and previously undescribed species of *Heliamphora* notable for the unique anatomy of its pitcher-appendage. The appendage is fused with the back of the pitcher forming a hollow structure running downwards on the outside of the back of the pitcher, apparently working as a chamber to store nectar produced by the glands of the appendage. Such a structure has never before been observed in *Heliamphora* or any other member of Sarraceniaceae.

Heliamphora folliculata Wistuba, Harbarth & Carow *spec. nov.*

Caudex ramosus; foliis rosulatis; amphoris 20-30 cm longis, tubulosis, basin versus infundibuliformibus, extus glabris, parte superiore interiore glabrio; appendice folliculato amphora deorsum adnato.

Inflorescentiis 3-4-floris, racemosis, ad 35 cm longis; flores nutantes; pedicellis 3-6 cm longis; tepalis 4 oblongo-lanceolatis, albidis vel pallide-roseis, 4-4.5 cm longis; staminibus 10, 1-serialibus, filamentis 8 mm longis; antheris oblongo-lanceolatis, ca. 8 nm longis; ovario valde tomentoso; stylo glabro; stigmate 3 lobato; seminibus fuscis, oblongis, ca. 2-3 mm longis, testa conspicue membranaceo-alata.

Herbaceous perennial; Rhizomes branching, plants forming dense clumps. Pitchers infundibulate in the lower third, cylindrical in the upper two thirds, 20-30 cm long and 5-6 cm wide in the upper part; upper part of the pitchers almost completely glabrous on the inner side; pitchers frequently compressed between the front and the back, the front being pressed inwards, leading to a kidney shaped mouth in most older pitchers when viewed from above; the left and right parts of the lobes forming the pitcher-tube often fused asymmetrically at the front of the pitcher-mouth; older pitchers deep red, younger ones golden-green with red veins; pitchers of younger plants much less compressed and more symmetric. Lid bent sharply towards the front, 1 cm long, 0.5 cm wide and 0.5 cm high, slightly helmet shaped; back of the lid of adult pitchers bearing a hollow structure running downwards 5-10 mm; channel from the hollow chamber to the front of the lid. Inflorescence about 35 cm long, 3-4 flowers, peduncle glabrous; pedicels 3-6 cm long; bracts ovate 3-5 cm long; tepals 4, oblong-lanceolate 4-4.5 cm long, 1.8-2.5 cm wide, white

to whitish-pink; 10 stamens in 1 series, filaments 8 mm long, anthers oblong-lanceolate, approximately 8 mm long, 1.5 mm wide; ovary 3 celled, pubescent, style glabrous; seed approximately 2-3 mm long, compressed, ovate, irregularly winged.

Specimens examined

Heliamphora folliculata: Murosipan Tepui, 8 February 2001, *Wistuba, Harbarth & Carow No. Mur 08.01.01/1*, holotype, flowering specimen (VEN)

Heliamphora folliculata: Murosipan Tepui, 8 February 2001, *Wistuba, Harbarth & Carow No. Mur 08.01.01/2*, isotype, flowering specimen (VEN)

Heliamphora folliculata: Aparaman Tepui, 8 February 2001, *Wistuba, Harbarth & Carow No. Ap 07.01.01/1*, isotype, flowering specimen (NY)

Distribution

Heliamphora folliculata is only known from the Aparaman-group of Tepuis, where we found it on all four mountains: Aparaman Tepui, Murosipan Tepui, Tereke Tepui and Kamakeiwaran Tepui. The largest population was observed on Aparaman Tepui where the plants were growing in dense overhanging populations, partly on vertical rock-faces. We did not observe notable morphological differences among the four populations, except for a single group of plants on Kamarkeiwaran that showed an extremely short appendage.

The two other tepuis in the area (Auyan Tepui and Ptari Tepui) are well explored. They are known to house two distinct species (*Heliamphora minor* on Auyan Tepui, and *Heliamphora heterodoxa* on Ptari Tepui) (Maguire, 1978; Steyermark, 1984). Differences between these two species and *Heliamphora folliculata* are given in Table 1. Accordingly, we believe that *Heliamphora folliculata* does not occur on these tepuis, and instead is endemic to the table-tops of the Aparaman-group.

	Heliamphora folliculata	*Heliamphora minor*	*Heliamphora heterodoxa*
Pitcher:			
Dimensions	20-30 cm long 5-6 cm wide	8-20 cm long 3-8 cm wide	15-40 cm long 5-6 cm wide
Shape	Infundibulate in the lower third, cylindrical in the upper two thirds; Pitchers frequently compressed between the front and the back, the front being pressed inwards	Slightly ventricose in the lower part, narrowly expanded to tubular in the upper part	Infundibulate to ventricose in the lower third, slightly infundibulate in the upper part, expanded near the mouth
Lid:			
Dimensions	1 cm long 0.5 cm wide	0.5-1 cm long 0.3-0.5 cm wide	1-3.5 cm long 1-3 cm wide
Shape	Bent sharply towards the front, slightly helmet- shaped; back of the lid of adult pitchers bearing a hollow structure running downwards 5-10 mm; not constricted at the base	Strongly helmet-shaped, extremely constricted to stalked at the base	Flattened to helmet-shaped; only slightly constricted around the base
Anthers/ Stamens:			
Length	8 mm	4 mm	6-8 mm
Number	10	15	8-14

Table 1: Comparison between *Heliamphora folliculata*, *Heliamphora minor* and *Heliamphora heterodoxa*.

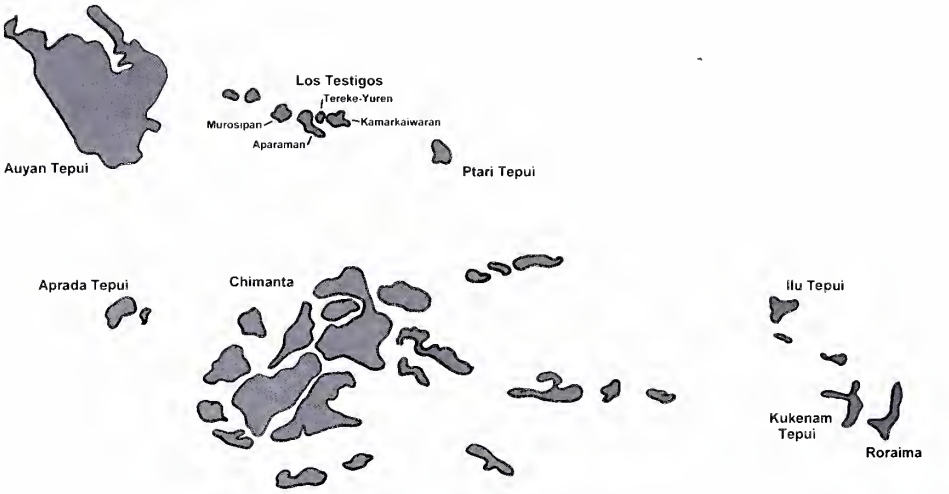

Figure 1: Map indicating the peaks in the complex of tepuis. The indicated peaks have elevations of more than 1500 meters higher than the surrounding plains. Prepared by Dr. Peter Harbarth and Dr. Andreas Wistuba.

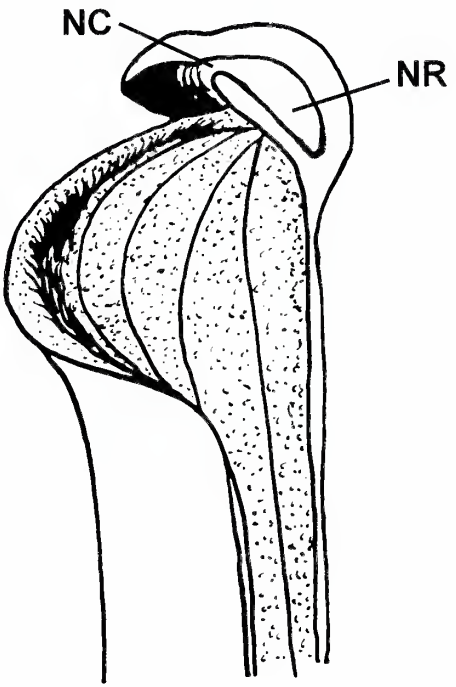

Figure 2: Drawing of the top of a *H. folliculata* pitcher in cross section. "NC" indicates the nectar channel under the lid appendage, "NR" indicates the nectar reservoir. Drawn by Dr. Peter Harbarth.

Figure 3: A group of *H. folliculata* pitchers on Aparaman Tepui. Photograph by Dr. Andreas Wistuba.

Figure 4: Details of *H. folliculata* pitchers. A)nectar (dark red) running down from the lid, B)lid showing the hollow hunchback-like structure, C)pitcher compressed front to back, leading to kidney shaped mouth, D)nectar reservoirs opened by insects. Photographs by Dr. Andreas Wistuba.

Ecology

Heliamphora folliculata plants were usually found growing in exposed areas with short vegetation such as grasses, bromeliads, *Xyris* (Xyridaceae) or *Stegolepis* (Rapateaceae). These plants do not shade the *Heliamphora* significantly, in fact we never found plants growing in shady locations. Most of the dense patches of *Heliamphora folliculata* were found on steep rocks with good drainage. Only rarely have we observed *H. folliculata* growing at really wet places, such as near shallow ponds or seepage slopes.

We opened a number of pitchers but a significant amount of prey was not present, so the efficiency of the trapping mechanism remains doubtful for at least during the dry season (the time we visited the Aparaman group). We have made similar observations for other *Heliamphora* species on other tepuis. However, other authors have reported an efficient capture rate of insects (Gonzales *et al.*, 1991; Jaffe *et al.*, 1992). Jaffe (1992) reported ants (Formicidae) as being a major component of the captured arthropods in *Heliamphora nutans* pitchers. For different *Heliamphora* species, they observed approximately 5-40 arthropods captured by a single leaf.

Another observation associated with the trapping mechanism is the fact that most of the nectar chambers of the appendages were opened and thus destroyed, most likely by wasps seeking the nectar inside. Unfortunately we had no opportunity to observe this happening, so we could not confirm wasps were responsible for this damage.

Interestingly, we frequently observed big black bumblebees pollinating the flowers. Bumblebees have been reported to be pollinators for other species of *Heliamphora* (Renner, 1989).

Another interesting observation was that there was a high percentage of pitchers damaged, most likely by caterpillars.

Related species

The unique architecture of this species' lid places it in an isolated position within the genus. *H. folliculata* does not seem to be particularly closely related to any species in the genus. The lid also easily distinguishes *H. folliculata* from *H. heterodoxa* and *H. minor* (the two *Heliamphora* species that occur on neighboring tepuis).

Etymology

The name '*folliculata*' was chosen to highlight the 'bubble' (=follicle) formed by the nectar spoon, the most distinct characteristic of this species.

Discussion

We assume that the structure formed by the lid is a highly derived characteristic rather than a relict lost in all other species. The diversity of the pitcher nectar spoon in the various species of *Heliamphora*—*H. minor* which has a highly differentiated helmet-like structure, *H. tatei* which has a rather simple flag-like structure, *H. heterodoxa* var. *exappendiculata* with its rudimentary lid, and the new species *H. folliculata* as described in this paper—illustrate the various ways the nectar spoon is shaped in order to function as the predominant structure for the attraction of prey (Jaffe *et al.*, 1995). While other authors reported significant amounts of prey (Gonzales *et al.*; 1991; Jaffe *et al.*, 1992), we view the efficiency of prey capture to be very poor when compared to the amount of dead arthropods regularly found inside the pitchers of other carnivorous pitcher-plants such as *Nepenthes* or *Sarracenia*. However, in the habitats where these latter plants grow, the competition with other non-carnivorous plants is much higher, and also many more arthropods occur there. So it is possible that the true prey-capture efficiency of *Heliamphora* is much higher than it appears at first sight if the extremely low overall density of the arthropod-populations on the table-tops of the tepuis is taken into consideration. The elaborate structures of the nectar spoons might facilitate the capture of a few

more prey, and these small numbers might well be sufficient to give the plant an advantage over other non-carnivorous plants in this harsh environment.

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